at constant flow (10 ml/min) with a modified Krebs-Henseleit-solution. This was followed by sequential perfusion (SP) without (group 1, n = 5) and with (group 2, n = 5) preceding IS (10 min) of the first heart (H1). In group 1 no significant changes of the contractile parameters of H2 were observed during SP. In group 2, after a global 10-min IS of H1 left ventricular (LV) systolic pressure of H2 (basal 76 ± 3 mmHg, SEM) immediately decreased by 16%, +LVdP/dt_{max} (1492 ± 112 mmHg/s) by 22%, −LVdP/dt_{max} (1261 ± 57 mmHg/s) by 30% when R was started. Coronary perfusion pressure (77 ± 3 cm H_2O) decreased by 26%. These parameters returned to baseline within 10 min. The cardiodepressant effect was not influenced by protease (chymotrypsine 0.005 U/l) or by heating the coronary effluent (CE) to 56ºC for 30 min. CE kept at room temperature for 24 hours before delivery to H2 also retained its activity. Incubation (30 min) of the CE with free radical (FR) scavengers (superoxide dismutase and catalase, 1×10^{-7} U/l, respectively) did not modulate its cardiodepressant effect. These data suggest the release of stable cardiodepressant mediators from myocardial tissue after global IS during R. FRs are not involved in the decrease in contractile force and the resistance against protease and heating suggest that proteins are neither implicated.

1055-33 Chronic Alcohol Use Attenuates Ischemia/Reperfusion Injury by Activation of Adenosine A1 and not A2 receptors

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In addition to decreasing the incidence of fatal coronary events, recent evidence demonstrates that chronic alcohol use (CAU) improves survival post-MI. To test the hypothesis that CAU improves survival post-MI by attenuating ischemia/reperfusion injury (I/R), we subjected hearts from guinea pigs fed 10% alcohol in their water for 6 wks (CAU), and age-matched controls (CTL), to 45 min ischemia and 48 min reperfusion. To determine if this protection was mediated, similar to ischemic preconditioning (PC), by activation of adenosine receptors, additional hearts underwent I/R in the presence of the A1 antagonist, 8-cyclopentyl-1,3-dipropylxanthine (200 nM), the A2 antagonist, 3,7-dimethyl-1-propargylxanthine (10 μM), or following PC. *Results:* After I/R, CAU hearts had 71% higher LV developed pressure (LVP), 52% lower diastolic pressure (LVEDP), and a 55% less creatine kinase release (CK). Adenosine A1, not A2, receptor blockade abolished the protective effect of CAU. Coronary flow and perfusion pressure were not different in any group. *Conclusion:* Attenuation of I/R by CAU is mediated via adenosine A1 and not A2 receptors, in a manner analogous to PC.

	Pre-ischemia			48 min Reperfusion		
	n	LVP (mmHg)	LVEDP (mmHg)	LVP	LVEDP	CK (U/g.ml)
CTL	10	112 ± 4	10 ± 0	35 ± 3	46 ± 4	356 ± 26
CAU	10	116 ± 3	10 ± 0	60 ± 2*	22 ± 2*	159 ± 25*
CAU + A1	10	113 ± 3	10 ± 0	31 ± 4	48 ± 5	374 ± 46
CAU + A2	6	120 ± 3	10 ± 0	56 ± 6*	24 ± 4*	179 ± 35*
PC	6	116 ± 4	10 ± 0	62 ± 6*	26 ± 4*	167 ± 21*

(mean ± SEM; *p < 0.05 vs CTL)

1055-34 Effect of Ischemia and Reperfusion on Lysoplasmalogen Accumulation in an In Vivo Canine Model

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Rapid activation of plasmalogen-selective phospholipase A2 (P-PLA2), previously shown during experimental ischemia-reperfusion, likely gives rise to the accumulation of lysoplasmalogens (LP), lysoplasmenylcholine (LPC) and lysoplasmenyl-ethanolamine (LPE), believed to play a deleterious role in ischemia-reperfusion injury. While shown in ischemia and reperfusion in isolated working hearts, accumulation of LPC and LPE *in vivo* has not as yet been documented. The purpose of this study was to determine the content of LPC and LPE in ischemic and non-ischemic myocardial tissue after 60 minutes of ischemia and again after 30 minutes of reperfusion in an in vivo canine model of transmural ischemia. Four anaesthesized mongrel dogs underwent left thoracotomy and occlusion of the mid left anterior descending coronary artery with a snare for 60 minutes. Biopsies were obtained from the ischemic and non-ischemic zones at the end of the ischemic period (I + 60) and again after 30 minutes of reperfusion (R + 30). LP were measured using two stage high performance liquid chromatography. The results of the content of LPC and LPE in nmol/gm wet weight are summarized in the table.

Sample	LPC (mean ± SD)	LPE
Nonischemic zone I + 60	631.9 ± 300.0	735.8 ± 425.6
Ischemic zone I + 60	1169.7 ± 396.6	1552.0 ± 425.6*
Nonischemic zone R + 30	552.3 ± 104.7	636.6 ± 44.3
Ischemic zone R + 30	650.5 ± 234.0	715.0 ± 294.5

p < 0.05 vs. Nonischemic zone I + 60 and vs. Ischemic zone R + 30

Regional transmural ischemia is associated with significant accumulation of myocardial LP, in particular LPE in the in vivo canine heart, possibly due to the activation of P-PLA2 in this setting. In contrast to isolated working heart models, LP levels in the in vivo canine heart return to normal by 30 minutes after the onset of reperfusion. Pharmacological inhibition of this activation may further clarify the importance of this mechanism.

1055-35 Detection of "No-Reflow" Zones in Reperfused Myocardial Infarction: MR Contrast Agents versus a Standard Fluorescent Tracer

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The "no-reflow" phenomenon was first demonstrated in reperfused infarction using the fluorescent tracer thioflavin S. The purpose of this study was to compare tomographic regional distributions of magnetic resonance imaging (MRI) contrast medium and thioflavin S in a rat model of the "no-reflow" phenomenon Sprague-Dawley rats subjected to coronary artery occlusion for 90 minutes and reflow for 4 hours. MR contrast agent and thioflavin S were administrated intravenously three minutes before sacrifice. Both ex-vivo MR images and 2 mm slices of the heart photographed under ultraviolet light were compared to infarcted and reperfused hemorrhagic areas. Myocardial specimens of "no-reflow" and control zones were prepared to measure thioflavin S concentration by high performance liquid chromatography. On post-contrast MR images, the enhanced region corresponded to the reperfused infarcted zone. Conversely, under ultraviolet illumination, a nonfluorescent "no-reflow" area was evident within the infarcted zone in all hearts and corresponded to hemorrhagic infarction on histology. However, a substantial quantity of thioflavin S was also present in both the nonfluorescent "no-reflow" (88 ± 13% of normal myocardium concentration) and the highly fluorescent reperfused regions (100.7±7.5% of normal, n = 9, p = NS). In vitro, addition of blood to thioflavin S solutions caused a quenching of thioflavin S fluorescence. In conclusion, we report that thioflavin S, an agent that has long been used to document the "no-reflow" phenomenon in various tissues, is not specific for detection of poor perfusion and gives a false diagnosis of "no-reflow" in presence of hemorrhage. The clinical MR contrast agent is a more reliable indicator of reperfusion since its effect on MR images is not vitiated by myocardial hemorrhage.

1055-36 Open Artery Reperfusion Produces Distinct Patterns of Myocardial Blood Flow-Glucose Metabolism Mismatch

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In treating acute coronary occlusion, open-artery reperfusion (OAR) may be superior to reperfusion through a residual stenosis. To test whether successful OAR restores normal tissue metabolism, we performed a 20-min left coronary occlusion followed by 24 hrs OAR in intact rats (n = 36). Ischemic areas averaged 49 ± 2% of LV volume. Two-D echo revealed regional hypokinesis 6 hrs after OAR, but by 24 hrs function recovered and reperfused regions were viable by TTC staining, light and electron microscopy. After 24 hrs OAR, 13NH3 and 18FDG were injected IV and hearts excised, sectioned and dual-isotope counted to compare myocardial blood flow (MBF) and glucose uptake in the reperfused area to remote regions. *Results:* MBF was 25 ± 8% (epicardial) to 33 ± 7% (endocardial) lower in reperfused than remote regions ($p < 0.05$), and all sections with reduced MBF exhibited increases in both flow-corrected (193 ± 61%) and absolute (82 ± 24%) 18FDG uptake ($p < 0.05$). Three distinct MBF-metabolism patterns were seen. Sections with < 25% MBF reduction had 18FDG/13NH3 ratios < 3.0. Those with > 50% MBF reduction had much higher ratios (6.6 ± 2.1, $p < 0.01$), indicating an exponential relationship between MBF and glucose uptake. Absolute 18FDG uptake was also higher in reperfused sections with normal MBF, suggesting a primary increase in cellular glucose avidity. Glycogen content, however, remained lower in reperfused than control regions (10 ± 5 vs. 21 ± 6 μmol/g, $p < 0.05$). *Conclusions:* 1) OAR preserves myocardial function and viability, but regional MBF declines over the subsequent 24 hrs; 2) Glycogen is not repleted by 24 hrs OAR, indicating that imported glucose is shunted into glycolysis. This suggests persistent dependence on glycolytic energy in reperfused regions. 3) Regions treated with OAR exhibit characteristic patterns of MBF-18FDG mismatch which allow them to be distinguished from both normal and non-viable myocardium.